CLAIMS

What is claimed is:

1. A capacitive ultrasonic transducer comprising at least one cavity defined by a first support electrode, insulating support walls forming with the support electrode wells and a membrane electrode supported by the support walls spaced from the support electrode and defining with the support electrode and support the walls the cavity, characterized in that, at least one isolation post or area of insulating material is formed in said cavity to prevent contact of the membrane electrode to the support electrode during operation of the transducer and minimize accumulation of charge.

2. A capacitive ultrasonic transducer as in claim 1 in which the support electrode is a low resistance silicon support and the support walls are an oxide, and the membrane is silicon.

3. A capacitive ultrasonic transducer as in claims 1 or 2 in which the least one isolation post or area is carried by the support.

4. A capacitive ultrasonic transducer as in claims 1 or 2 in which at least one isolation post or area is carried by the membrane.

5. A capacitive ultrasonic transducer as in claims 1 or 2 in which isolation posts or areas are located at selected locations with the size, shape and height selected to prevent shorting between electrodes and minimize the number of trapped ions.

6. A capacitive ultrasonic transducer as in claim 5 in which the height, shape and location of the posts or areas is selected so that the membrane comes in contact with the posts during post contact operation of the transducer.

7. A capacitive ultrasonic transducer comprising:

at least one cavity defined by a support substrate forming a first electrode of said transducer, walls of insulating material on said support and a thin membrane supported by said walls and forming the second electrode of said transducer; and

at least one post or area of dielectric isolation material in said cavity for limiting the deflection of said membrane during operation to prevent contact of the membrane with the support substrate during operation of the transducer and minimize accumulation of charge.

8. A capacitive transducer as in claim 7 in which the membrane material is selected from silicon, silicon nitride, sapphire or diamond.

9. A capacitive ultrasonic transducer as in claims 7 or 8 in which the posts or areas of dielectric isolation material are a dielectric isolation material.

10. A capacitive ultrasonic transducer as in claim 9 in which the walls of insulating material are a dielectric isolation material.

11. A capacitive ultrasonic transducer as in claims 7 or 8 in which the posts or areas are formed on the support substrate.

12. A capacitive ultrasonic transducer as in claims 7 or 8 in which the posts or areas are formed on the membrane.

13. A capacitive ultrasonic transducer as in claims 7 or 8 in which the location of the posts or areas is chosen to optimize the frequency response of the transducer.

14. A capacitive ultrasonic transducer as in claim 13 in which the size, shape and height of the posts or areas is further chosen to optimize the frequency response of the transducer.

15. A capacitive ultrasonic transducer comprising at least one cavity defined by a first support electrode, insulating support walls forming with the support electrode wells and a membrane electrode supported by the support walls spaced from the support electrode and defining with the support electrode and the support walls of the cavity, characterized in that, at least one isolation post or area of insulating material is formed in said cavity to prevent contact of the membrane electrode to the support electrode during operation of the transducer and minimize accumulation of charge.

16. A capacitive ultrasonic transducer as in claim 15 with any combination of one or more posts or areas at any selected location with height, size and shape which prevents shorting

between the electrodes during operation of the transducer and minimizes accumulation of charges.